



The Importance of Distance Learning Practices for Continuity of Physics Learning in the Context of Teacher Strikes: The Perspective of Secondary School Students in Morocco

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Abstract

The aim of this study was to investigate the importance of distance learning during national or international crises, such as the case of the 4-month teachers' strike in Morocco at the end of 2023, and to identify students' perceptions of several aspects of this experience as actors and beneficiaries of distance learning. The question of this research is: how can distance learning guarantee the continuity of physics in Morocco during a prolonged teacher's strike? This study is being carried out for the two cycles of secondary education in Morocco during the period between February 5, 2024, and March 10, 2024. Data was collected using an anonymous questionnaire. We made this questionnaire using Google Forms and shared it with our acquaintances. To analyze the data, we used EXCEL 2010 as an aid to qualitative analysis. This study shows that distance learning is a viable means and solution to ensure continuity of student learning during a national crisis such as this year's teachers' strike, provided careful planning by the Minister of Education, appropriate resources, and technical support are in place to ensure the smoothest possible transition to an online learning environment. And according to learners' statements, distance learning can never replace face-to-face classroom teaching; it can only complement the traditional teaching that takes place in schools.

Keywords: Distance learning, ICT, Pedagogical continuity, Teachers' strike.

1. Introduction

Morocco experienced a teachers' strike for an extended period of 4 months, from December 2023 to the beginning of January 2024. As a result, it is necessary to migrate rapidly from face-to-face training arrangements to a method of integrating ICTE into teaching [1][20], whether face-to-face or distance learning, in order to recover learners' key learning and finalize the physics curriculum for the various levels [2].

This crisis has prompted the ministries concerned to put in place various measures to preserve the academic season by promoting distance learning as a complement to face-to-face teaching. In addition, this crisis has led millions of teachers and trainers to adjust their courses and training programs. In a very short space of time, they have had to find solutions to disseminate information, carry out exercises, and support their students online. Some of them have long been interested in the use of digital objects, but adapting to this situation remains extremely difficult [3].

Distance learning can be used as a temporary solution in a variety of situations. When teachers are unable to deliver lessons in person, schools can use distance learning approaches to reduce disruption to the school calendar and ensure continuity of student learning.

In this context, distance learning may involve the use of online platforms, digital teaching resources, pre-recorded videos, live virtual classrooms, and other technological tools to deliver lessons to students. Teachers also have the opportunity to communicate with their students using online discussion forums, e-mail, video chat, or other means of digital communication to answer their questions and support them in their learning process [4][5].

In times of teacher strikes, distance learning can be an alternative to ensure continuity of learning, maintain students' progress in their curriculum, offer flexibility to students who can continue learning from home [6], and reduce disruption to school timetables [7]. However, it can also create difficulties, such as limiting access to the teacher for face-to-face exchanges, the need for students to have reliable internet access and appropriate computer equipment, and the requirement to adjust pedagogical methods for an online learning environment to ensure an equitable, quality educational experience for all individuals [8, 26, 27].

The need for this study lies in the fact that it addresses a specific and recurring issue in Morocco, namely teachers' strikes and their impact on the continuity of teaching and learning processes in Moroccan schools, which has not been sufficiently studied in the existing literature. In contrast to studies on distance learning during the

pandemic, this research focuses on strikes as a disruptive factor and students' perspectives on the continuity of physics learning in this context as actors and beneficiaries of distance learning. The research proposes practical solutions for decision-makers and educators to better manage such situations in the future.

The objectives of this study include:

- Analyzing the relevance of distance learning during national or international crises, such as the teachers' strike in Morocco

- Identify the opinions of students regarding various aspects of distance learning as both actors and beneficiaries of this experience.

- Investigate how distance learning can ensure the sustainability of physics teaching in Morocco during a prolonged teachers' strike.

2. Literature Review

During strike periods, classes are often suspended, interrupting the regular flow of learning and compromising the continuity of the physical science curriculum. Students may miss crucial lessons and be left with gaps in their understanding of fundamental concepts. Prolonged periods without direct instruction can reduce students' motivation to learn physical sciences. They may lose their usual pace of study and find it difficult to get fully back on track with learning once classes resume.

They may find themselves ill-prepared for the official tests and national examinations that are important for their academic progress.

Teacher strikes in Morocco seriously disrupt learning in the physical sciences, creating obstacles such as interrupted classes, reduced teaching time, reduced student motivation, limited access to educational resources, and negative impact on academic performance. These challenges require effective strategies to ensure continuity of learning and mitigate the long-term repercussions on the education of Moroccan students.

As part of this, the Ministry has brought together various organizations and players from the public and private sectors, as well as civil society associations (as part of the AWRASH program), and asked them to work together to implement distance learning as a strategic option. This involves the use of a variety of ICT tools to enable students to follow their courses away from the institution, which ensures a certain pedagogical continuity

According to UNESCO, distance learning is defined as "a teaching method, provided by an institution, that does not require the physical presence of the teacher in charge of giving it at the place where it is received, or where the teacher is present only at certain times or for specific tasks" [9]. According to the AFNOR, this type of education is described as a distance learning system "designed to offer individuals the possibility of learning without having to travel to the training location and without the physical presence of a trainer." [10] The broader concept of open and distance learning encompasses distance training.

Distance education can be defined as "[a] system of training that allows an individual student or group to learn independently or collaboratively using appropriate instructional materials, various communication channels, and remote support from an instructor and other resources". Flexible scheduling within the university calendar and no need to travel, except as required for summative learning assessments, is the difference it highlights compared to traditional teaching [21].

distance learning today encompasses a wide range of modalities. A course can be given in a synchronous way when it is organized at a given time, in real time, where interactions are virtual between student and teacher according to videoconferences, audioconferences, and videoconferences; in an asynchronous way, allowing the student to follow the courses at his convenience (he uses the learning resources available and interacts by means of discussion forums); or in a hybrid way, which is a combination of the two types of modalities above [11] [12].

According to Peraya and Peltier (2020), the distinction between teaching and learning in training and distance education highlights the importance of "traditional" pedagogical engineering and the separation of roles it teaches [13]. According to the authors, this engineering model therefore comprises two essential elements: planning and mediatization.

In distance learning, the flexibility of time and the collaboration between learners and teachers make the planning of activities and the interactions they can generate one of the essential elements of engineering that the teacher must develop [15].

Distance learning is characterized by its flexibility, both spatially and temporally. By offering teaching and learning situations that take into account the individual constraints of each student, this teaching system offers greater accessibility to audiences (Gonzales, 2023).

According to M'hammed Drissi and al. (2006), distance learning enables learners to learn in their immediate environment. As such, it maintains a direct, immediate and continuous relationship with the various elements of the environment, facilitating the integration of scientific knowledge with practical knowledge and the sharing of knowledge [14].

According to Françoise D. (2023), e-learning offers greater freedom than face-to-face training [16]. According to Eneau and Somonian (2011), flexibility refers to the suppleness in pedagogical organization that allows learners to control their study activities and learning pace in time and space [17]. In addition, it can design activities that give the learner the opportunity to make decisions about content, methods, and interactions, taking into account individual constraints [18].

Distance learning requires educational technologies such as online platforms, videoconferencing tools, and digital resources, which can foster the development of digital skills in students [19]. Encourage students' freedom to learn and take responsibility for their own education, as they are often faced with managing their own time and studies [15].

3. Methodology

3.1. Participants and Sampling Methods

Our survey targets a population of 240 learners, distributed as follows in the table below (Table. 1):

Table 1. Learner information.

Genre		Age				Teaching Cycle	
Girls	Boys	[12 ; 14]	[15 ; 17]	[17 ; 20]	>20	Middle School	High School
58 %	42 %	19 %	39 %	33 %	9 %	36 %	64 %

The female students surveyed outnumber the male students, most of whom are between 15 and 20 years old, and most of whom are enrolled in a qualifying secondary school.
The research sample was selected at random.

3.2. Study Design and Procedures

This research concerns both levels of secondary education (middle school and high school) in Morocco during the period from February 5, 2024, to March 10, 2024.

In order to gather relevant information for our study, we used the anonymous questionnaire as an essential tool for obtaining statistical data on distance learning during the teachers' strike.

We created the questionnaire using Google Forms and distributed it to secondary school students in the city of Fez. In order to analyze the data, we chose to use Excel 2010 software as a tool for qualitative analysis.

To ensure optimum validity, a preliminary study was carried out to assess the questionnaire's relevance, robustness, and content validity. The questionnaire was initially submitted to fellow teachers for evaluation, who then offered feedback and suggestions for improving its quality. After the completion of this preliminary phase, the revised questionnaire was distributed to participants via Google Forms.

4. Results and Discussion

4.1. Environment and ICT

According to Figure 1, the majority of students said they have a smartphone at home, while only 33% have a computer or tablet. What's more, the majority have not always been connected to the Internet. This can be explained by the low purchasing power of most Moroccan families, as well as by the fact that the Ministry of Education has not provided support for learners to acquire modern technologies for their distance learning.

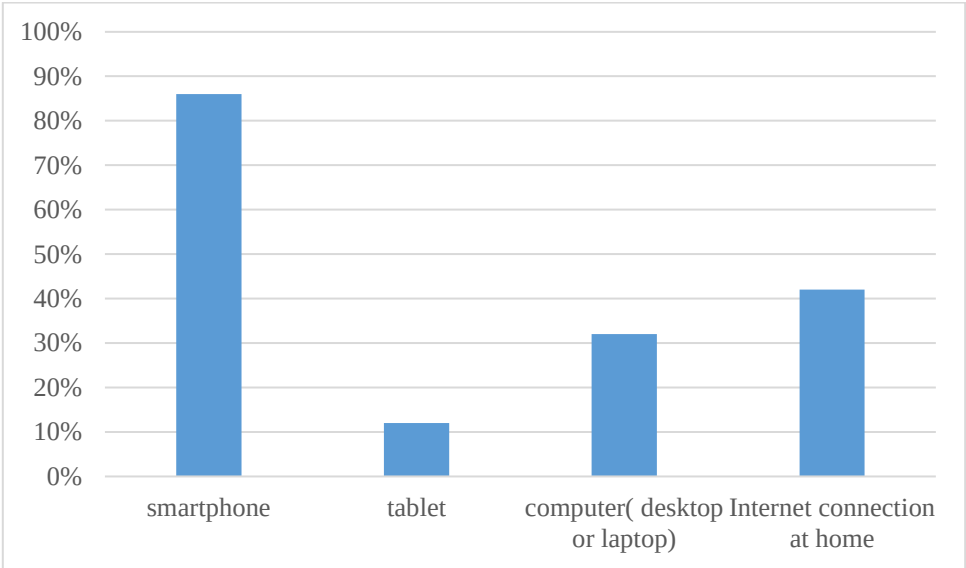


Figure 1. Environment and ICT.

Most students reported that they took their courses at a distance during and after the strike in order to catch up on knowledge and ensure pedagogical continuity. This is highly relevant, as the Ministry of Education has consistently emphasized the use of various educational platforms and applications to facilitate the virtual transformation of classrooms. This transition has created a shared learning space for students residing in different locations. This technological aptitude is particularly significant and points to the rapid adoption and implementation of distance learning [16].

This is why distance learning is becoming an opportunity (perhaps even a necessity) in the face of resource shortages, rising expenses, and widespread access to better and more popular sources of learning. What's more, in the event of strikes, epidemics, or other unprecedented situations, distance learning becomes the only way to guarantee pedagogical continuity [3].

4.2. Preferred Tools of Use

According to the students' responses, the majority prefer smartphones for their flexibility and quick installation of applications. They use these devices to receive instructions, lessons, videos, audios and even notes. With phones, feedback is almost always faster than with any other device. In terms of cost, smartphones are generally more affordable for students. For these reasons, they've opted to use their phones, interacting digitally with teachers and others during this national crisis, mainly via WhatsApp and Facebook Messenger.

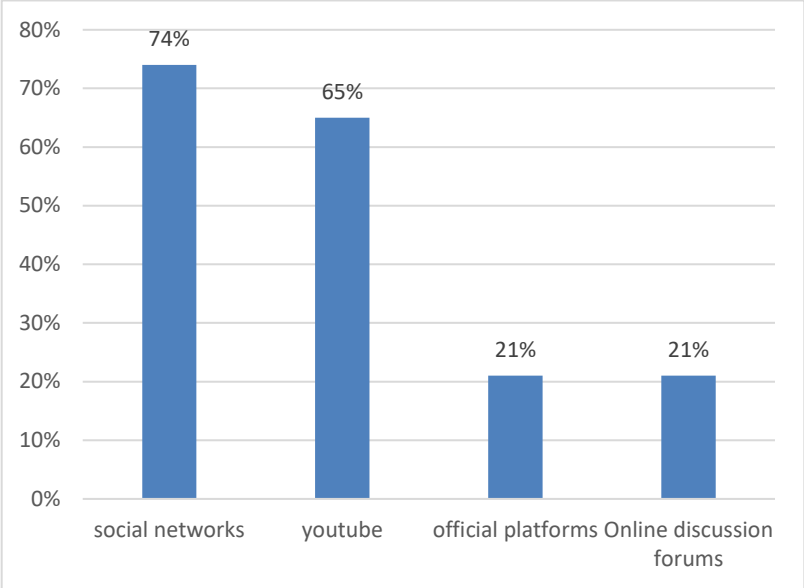


Figure 2. Preferred tools of use.

Figure 2 shows that respondents prefer social networking tools (74%) and YouTube videos (65%) to better understand their teacher's explanations and to get closer to the reality of classroom teaching. This choice can be explained by the following factors:

- The availability of these applications on smartphones (means made available to students).
- Ease of use and multi-functionality.
- The lack of skills to use and exploit other applications such as Microsoft Teams, Moodle, Google Classroom, Zoom, Meet, etc.

And it was found that only 20% of the students surveyed use the Minister's official platforms and online discussion forums, which can be attributed to:

- The official platforms for learners were not well presented by the Minister of Education.
- The Minister of Education's official platforms did not provide learner-friendly content.

4.3. Duration of the Distance Learning Course per Day

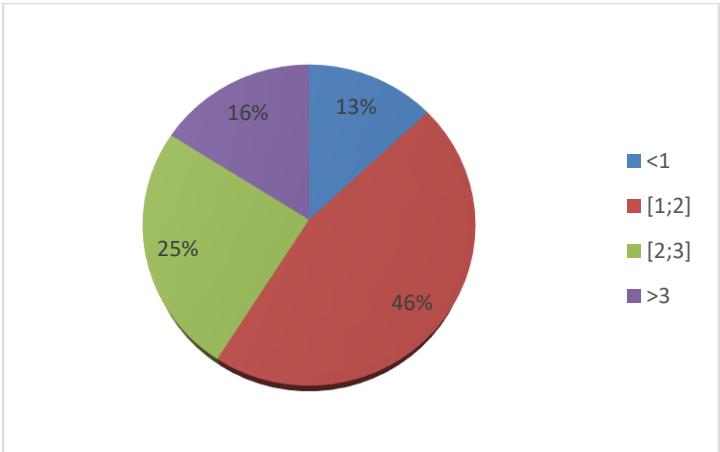


Figure 3. Duration of the distance learning course per day.

According to Figure 3, almost half of the learners surveyed said they spend between one and two hours learning at a distance. This result can be justified by:

- Many students show a lack of interest in online courses, not fully understanding their importance for learning. This lack of interest can lead to a decrease in concentration and insufficient retention of information, which is detrimental to the quality of their academic progress.
- The need to spend long hours in front of a computer or smartphone screen can be monotonous and exhausting for students. This risks reducing their engagement and motivation, despite attempts to capture their attention during online courses. This visual and cognitive fatigue can also compromise their ability to assimilate information and engage fully in educational activities.
- The lack of adequate equipment in homes where a limited number of computers or smartphones have to be shared between several family members can lead to scheduling conflicts and make it difficult to access the resources essential for effective participation in online courses. Students may find themselves having to manage busy schedules or sacrifice access to educational opportunities, hindering their continuing education during periods of teacher strikes.

4.4. Importance of Distance Learning During the Teachers' Strike

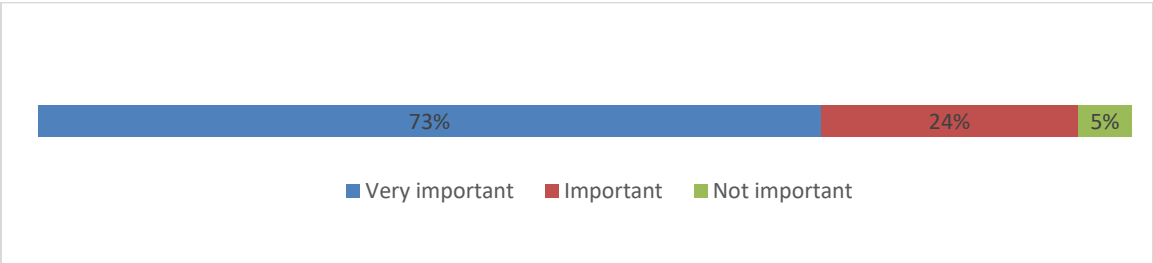


Figure 4. Importance of distance learning during the teachers' strike.

The results show that 97% of students consider distance learning to be important or very important to ensure continuity of teaching during a teacher strike, indicating strong support for the solution.

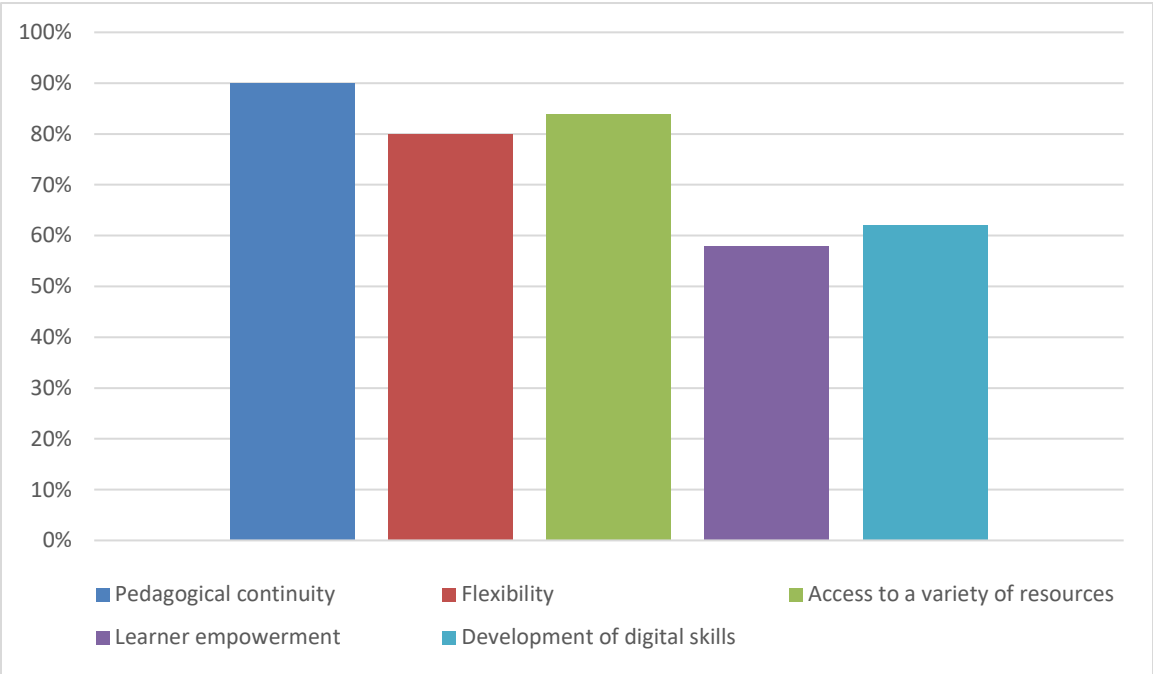


Figure 5. The benefits of distance learning during the teachers' strike.

According to Figure 6, the results show that students perceive distance learning as an effective solution for maintaining pedagogical continuity (90%) and reducing costs (90%) during teacher strikes. Flexibility (80%) and access to a diversity of resources (84%) are also valued by distance learners. Furthermore, over 58% of students believe that distance learning can empower learners, develop their digital skills, and enable collaboration. These results indicate that distance learning is an effective solution for overcoming the challenges posed by teacher strikes.

4.5. Distance Learning and Face-to-Face Learning

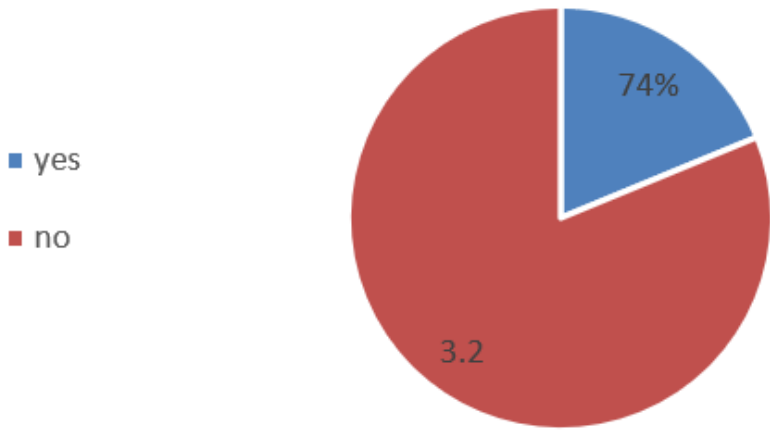


Figure 6. Successful distance learning.

Significantly, 74% of participants (Figure 4) emphasized the fruitfulness of this approach. This high percentage is more than just a figure; it reveals an inclination towards distance learning, and a willingness to explore effective pedagogies and platforms to ensure its success. In reality, distance learning can be just as successful as traditional teaching, provided it is properly regulated and used wisely, as its benefits have the potential to radically transform the way educators and learners perceive education.

At the end of the interview, learners were asked what they thought of distance learning. The majority of learners surveyed said that distance learning never replaces face-to-face teaching. Distance learning is therefore complementary to face-to-face teaching.

Almost three-quarters of students are satisfied with the level of commitment of their teachers to the distance learning experience. Over 63% of respondents say that there is a lack of technical and administrative support in their training courses.

5. Interpretation of Results

The results of this study reveal that distance learning, while effective in maintaining some continuity of teaching during crises such as the teachers' strike in Morocco, fails to fully replace the face-to-face learning experience. Students reported significant benefits, including increased flexibility and continuous access to learning resources. However, they also highlighted significant challenges, such as the lack of direct interaction with teachers and difficulties in accessing the necessary technologies. These findings are consistent with previous studies [5] [23], which indicate that distance learning can serve as a temporary solution, but has limitations when it comes to replacing traditional classroom teaching. The study thus confirms that, although distance learning can support pedagogical continuity in times of crisis, careful preparation and adequate resources are essential to maximize its effectiveness. The results also underline the need for a hybrid approach, combining the benefits of distance learning with those of face-to-face teaching, to create a more robust learning environment adaptable to future disruptions.

Research also confirms that for distance learning to be truly effective, careful planning and appropriate resources are essential. It is essential that students have access to appropriate technological tools and receive adequate technical support to overcome the difficulties associated with online learning [24].

Distance learning should be integrated into a hybrid educational strategy, combining the strengths of face-to-face and online teaching. This would not only respond to the challenges posed by the current crises, but also strengthen the education system's ability to cope with future disruptions.

The results of this study indicate that, although effective in the short term, distance learning should be seen as a complement to traditional teaching, not as a complete replacement. This conclusion is consistent with research [25].

Distance learning has become both an opportunity and a necessity in the face of scarce resources, rising expenses and widespread access to better, more popular sources of learning that were previously reserved for the few.

More specifically, in times of crisis, pandemic (such as COVID-19) or other unprecedented situations, distance learning becomes the only option to ensure continuity of education, as was the case during this crisis. This conclusion is consistent with research [22].

6. Limitations

- This study was conducted on 240 student's secondary schools in the city of Fez.
- The choice of sample may not reflect all secondary school students in Morocco.
- Due to the limited samples, it would be useful to conduct similar research in a different discipline with a large number of samples, and this study is specific to the Moroccan context only.
- Morocco's cultural and socio-economic context may influence students' perceptions of distance learning.
- Strikes can have varied and unpredictable impacts on learning, making it difficult to assess the effectiveness of distance learning practices.

7. Conclusion

Distance learning is a flexible and innovative learning system, enabling students to learn alone or collaboratively with remote support from the teacher and resource persons. Over the generations, distance learning has evolved thanks to new technologies [21].

This study shows that distance learning is a viable means and solution to ensure continuity of student learning during a national crisis such as this year's teachers' strike, provided careful planning by the Minister of Education, appropriate resources, and technical support are in place to ensure as smooth a transition as possible to an online learning environment. And according to learners' statements, distance learning can never replace face-to-face classroom teaching; it can only complement the traditional teaching that takes place in schools.

Under current conditions, distance learning in the Moroccan education system may not facilitate learning and the development of learners' knowledge. In fact, the use of social networks and YouTube as teaching aids does not help teachers make the most of their courses for learners, and this is due to the lack of training for teachers and learners in the use of effective aids such as Microsoft Teams. Participation rates and learner interactivity are low due to the lack of materials, the absence of an Internet connection, and the lack of skills to make the most of distance learning.

These difficulties have a negative impact on distance learning performance.

In the light of these results, it seems to us that:

Distance learning is essential, even primordial, for managing crises such as the COVID-19 health crisis, the long-term teachers' strike, etc.

Moroccan teachers and learners need training in curriculum-related technological skills to successfully use ICT in distance learning.

The Minister of Education's contribution to providing modern technologies and Internet connections to teachers and learners at preferential prices.

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